Loche - Materials used by Slater at Final Plenary 10/29/92. PK

REPORT OF

MODIS SCIENCE TEAM CALIBRATION GROUP

Philip N. Slater

October 29, 1992

Action items from Monday, October 26, 1992

1. Require written comments on calibration documents by 11.20.92.

(MODIS Science Team calibration group)

2. Suggest need for contamination monitor. (Science Team).

3. Study of interaction between :

   Registration accuracy
   MTF
   Aliasing
   Re-sampling
   Calibration accuracy

   for typical scenes. (MCST and ?)

4. Prioritization of band registration (Science Team this meeting).

5. Allow MODIS to view moon at near 0° phase on a monthly basis.

(Project).

6. Improve stability of SDSM for possible use as an absolute calibrator

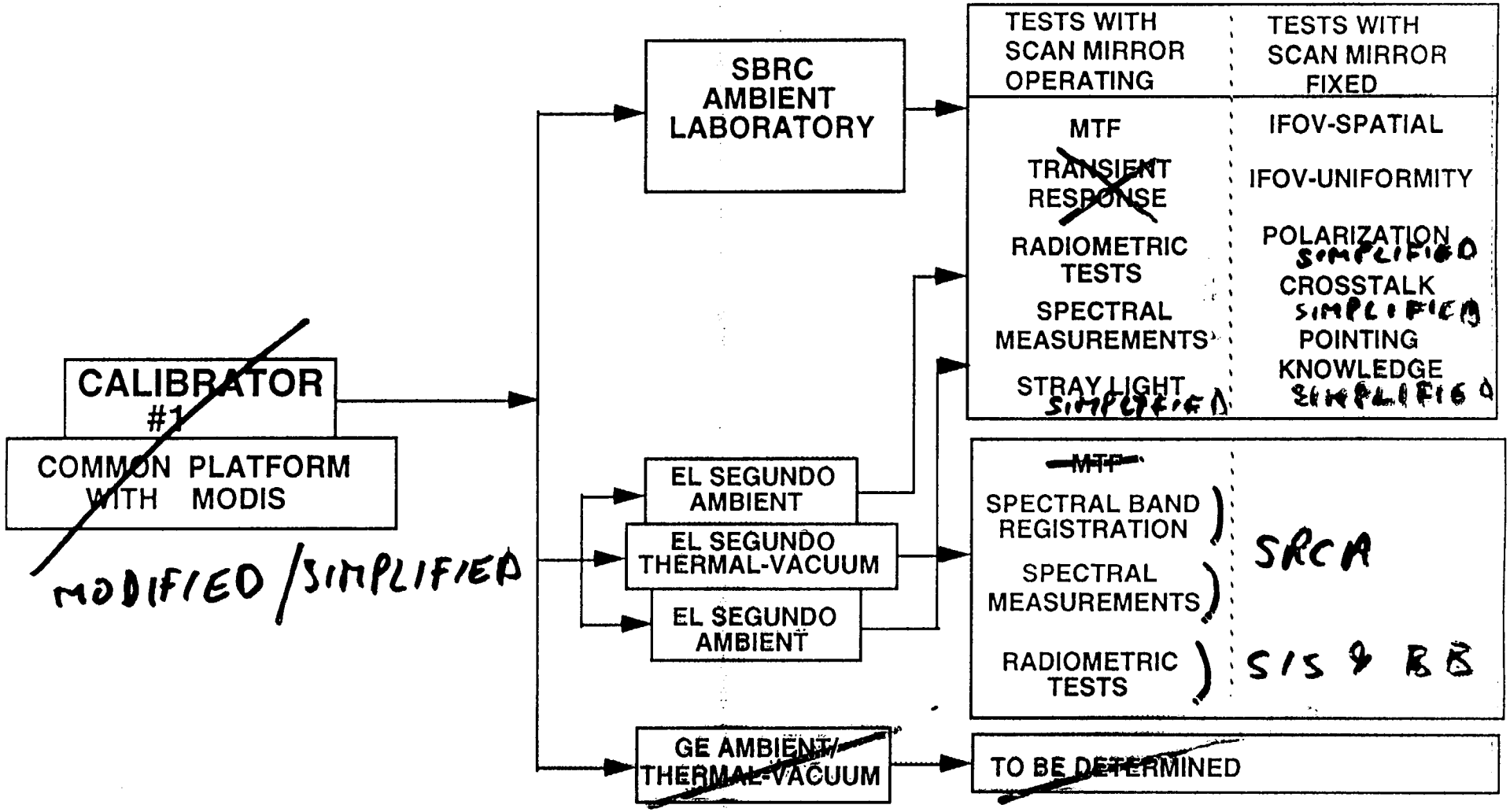
(SBRC).

7. Discuss peer review plan for MCST. (Barker, Guenther, Salomonson,

Slater).

THE CALIBRATOR MUST ADAPT TO ~~INTERFACE~~ BUDGETARY REQUIREMENTS

HUGHES
SANTA BARBARA RESEARCH CENTER
a subsidiary



CALIBRATION DESCOPE DISCUSSIONS

OF OCTOBER 28, 1992

1. The budget problem.
2. Philosophy of solution.
3. Implementation of solution.
4. Impact on preflight measurements.
5. Impact on in-flight measurements.
6. Action items.

The Budget Problem

1. The cost for Ground Support Equipment (GSE) i.e. preflight calibration, characterization and test equipment, has risen by $4.6M in FY93.
2. The cost for optical design, to meet distortion/registration requirements, has increased over $1M in FY93.
3. The mechanical design has also increased by a similar amount because of a change from graphite composite to beryllium to facilitate registration by reducing thermal gradients.
4. Detector yield, cost unstated.
5. Labor rate?

Philosophy of solution

1. Maintain the in-flight on-board calibration capability, i.e., the solar diffuser, SDSM, BB, and the SRCA.
2. Reduce the reliance on the GSE calibrator for preflight calibration, possibly eliminate both calibrators.
3. Rely on an enhanced SRCA for preflight and in-flight spectral, spatial, and radiometric calibration.
4. Relax the registration requirements across all focal planes (0.1 to 0.2).

Implementation of solution

1. Eliminate the three cooled SWIR detectors in the SDSM. (Not a contractual obligation.)
2. Simplify the solar test source (aliveness) for the SDSM/diffuser ($0.15M).
3. Eliminate the second GSE calibrator ($1M in FY93, $1.5M total).
4. Eliminate most of the T/V characterizations.
5. Simplified stray light measurement.
6. Simplify the crosstalk measurements .
7. Pointing knowledge to be determined by alternate method to GSE calibrator.
8. Add/modify silicon photodiode output radiance monitor to SRCA.
9. Enhance redundancy in SRCA design.

Impact on preflight measurements

Unaffected:

1. Accurate calibration using integrating sphere in ambient.
2. Accurate calibration using large-area BB in T/V.

Eliminated:

1. T/V measurement of MTF, which will result in reduced accuracy.
2. GSE calibrator monochromator spectral characterization, replaced by SRCA.
3. GSE calibrator phased reticle measurements of spectral band registration, replaced by SRCA.
4. GSE ambient and T/V tests at GE.
5. Transient response test, assume eliminated by the new electronics .

Impact on in-flight measurements

1. The SRCA will be of improved design to allow for the more accurate transfer of preflight to in-flight absolute calibration. It will have more redundancy built in, and lamp heat problems will be addressed.
2. The more extensive use of the SRCA for preflight calibration and characterization now means that preflight and in-flight MODIS calibrations and characterizations will be more self-consistent.
3. The design of the solar diffuser stability monitor is to be reconsidered to determine if the solar diffuser can provide an absolute calibration.

Action items

1. SBRC to develop a two-level descope list. The first to reflect, in general, the items discussed thus far and their budgetary impact. The second, to the extent possible, to indicate extreme measures but still preserving the perceived MODIS science requirements, and to estimate their budgetary impact.
2. SBRC to forward results of the above to GSFC as soon as possible.
3. SBRC and GSFC to negotiate the specification changes required to permit these descopes.